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ABSTRACT

This paper describes Project NExT (New Experiences in Teaching), a professional development program for new or recent Ph.D.s in the mathematical sciences. The program consists of workshops and short courses on teaching, establishing a research program, involving undergraduates in research, grant writing, and balancing teaching and research. An introduction to the program and the testimonies of three Project NExT fellows writing about their experiences as new faculty members at research institutes are featured. (MM)

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Project NExT

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Project NExT (New Experiences in Teaching) is a professional development program for new or recent Ph.D.'s in the mathematical sciences sponsored by the Mathematical Association of America (MAA), with partial funding from the Exxon Education Foundation. The program is designed for those who are interested in improving the teaching and learning of undergraduate mathematics. Since 1994 more than 400 "NExT Fellows" have participated in intensive sessions at national meetings, where they learn how to enhance their teaching and launch their mathematical careers. Applications to the program are due in the spring, and before the summer begins about 60 new Project NExT Fellows are chosen. They start by attending a workshop held just prior to the MAA summer meeting, where they meet the previous year's participants, who are just concluding their fellowship year. After the workshop the fellows attend the MAA meeting and choose among short courses designed specifically for them. Although the emphasis of the workshop and short courses is on teaching, additional topics—such as establishing a research program, involving undergraduates in research, grant writing, and balancing teaching and research—are covered as well. The following January at the Joint AMS-MAA Mathematics Meetings the new fellows attend special events that they organize themselves. During the school year they stay in touch by participating in an electronic network (the "NExT list") through which they can share ideas and get help on problems they encounter as new faculty members. Moreover, each fellow is assigned a more experienced person from the mathematics community who serves as an informal consultant and with whom the fellow can communicate and interact.

At the invitation of the editors of the *Notices*, three NExT Fellows were asked to describe how Project NExT has affected their experience as new faculty members at research institutions. Their responses follow.

—Joseph A. Gallian, Aparna Higgins, and T. Christine Stevens

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T. Christine Stevens is director of Project NExT and professor of mathematics and mathematical computer science at St. Louis University. Her e-mail address is stevensc@slu.edu.

Jon Jacobsen

I found out about Project NExT through a letter from Thomas Banchoff, president of the MAA, and Christine Stevens, director of Project NExT, that was circulated in the mathematics department at the University of Utah, where I was completing my Ph.D. The letter spoke of a program that addresses "a full range of professional issues, focusing on the teaching and learning of

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The application deadline for Project NExT for 2000-01 is April 14, 2000. Application materials are available on the Project NExT Web site (`http://archives.math.utk.edu/projnext/`) or from T. Christine Stevens, St. Louis University (`stevensc@slu.edu`).

undergraduate mathematics" and "concerns of young faculty about balancing the many demands on them for teaching, maintaining scholarly activity, and giving service to the department, the institution, and the profession as a whole." I found these topics to be extremely relevant to many of my thoughts and concerns at a time when I was both anxious and excited about making the transition from graduate student to junior faculty.

The first meeting for the the 1999-00 NExT Fellows was held at Brown University, just prior to the summer MathFest in Providence, RI. I can say with confidence that the meeting was a success for all who participated. The program not only delivered pertinent and diverse information having a direct bearing on my new academic situation, but also provided me with an outstanding network of mentors and fellows, each of whom shares a common interest and commitment to quality research and education in mathematics. Let me mention a few specific items from the meeting that I found important:

1. One presenter encouraged us to offer our services as reviewers to publishers. I was certainly interested in this type of service but unaware of how to get involved. While discussing my work with a publisher at the conference, I tried this out, and it looks as if I will get a chance to review a forthcoming text in my area.

2. The panel discussion on tenure was very informative and featured panelists from a wide range of institutions.

3. The short course "Getting Your Research Off to a Good Start/Applying for Research and Education Grants" was an extremely interesting and informative workshop. It was particularly nice to have Lloyd Douglas, a program director at the National Science Foundation, go through the basics of grant proposals.

4. The workshop "Adding the Words: Using Writing to Teach Mathematics" was very interesting. This is a topic on which I find I spend a lot of time in my classes. I have already put some of the ideas from this workshop to work in my undergraduate partial differential equations course.

5. Other informative presentations included "Conversation with the Leadership", "Thoughts on the Purposes, Methods, and Results of Research in Undergraduate Mathematics Education", "Choosing a Way to Teach Calculus", and "The Faculty Member as a Teacher and a Scholar". All of these had vital information for any mathematician.

6. The inspiring presentation "Finding Your Niche in the Profession" provided an excellent closing session to the first meeting.

Project NExT has had a considerable effect on my experience as a new faculty member at Penn State. The e-mail listserver has kept me in direct contact with a lively group of new mathematicians, all willing to share insights, resources, and often ingenious ideas from their unique perspectives. I look forward to this connection for years to come. As another example, I have had great success employing several ideas from the workshop concerning the use of writing as a tool to teach mathematics. I have learned a great deal about my students' understanding (and what misconceptions were conveyed in my lectures to them) from reading their writing assignments. Finally, I recently became involved in a project at Penn State developing a freshman calculus sequence for engineering majors. This innovative program combines projects, labs, and written assignments, with the goal of not only improving the students' understanding of calculus and its applications to engineering but also improving their ability to clearly and competently present their work. I feel my experience with Project NExT has made me a more effective contributor to this project.

Project NExT is a well-organized program designed to enhance and support the community of new and recent Ph.D.'s. I highly recommend that any new faculty member consider applying for a NExT Fellowship, as the benefits are numerous.

Matt Hudelson

My formal involvement with Project NExT began in spring of 1996 when I applied to be a 1996–97 fellow. I had heard about the program earlier at previous Joint Meetings and, having nearly finished my first year on the faculty at Washington State University, I decided to apply. Since my next two years at WSU would involve teaching the first-year calculus sequence, I viewed Project NExT as a priceless opportunity to garner much-needed information and strategies for teaching these classes. The other myriad personal and professional development opportunities which Project NExT offered were too enticing for me to pass up as well.

In the summer in which I began my Project NExT Fellowship, the Summer Mathfest was at the University of Washington in Seattle. At the meeting I was able to meet a host of people in circumstances similar to mine: they too were at the start of their professional academic careers, somewhat bewildered by the responsibilities and expectations, and hungry for dynamic ideas for the classroom and their research. During this time and at the next two national meetings, I was able

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to forge friendships and working relationships which I expect will prove indispensable during my career.

From my earliest association with Project NExT, I have felt a part of an incredible network of fellows and consultants. This has been the essential core of the Project NExT experience. However, one's typical experience in Project NExT extends far beyond networking. For me, the workshops at the various national meetings were intensely valuable. It was extremely helpful to discuss new instructional strategies with others who have implemented them in their own classrooms. I was able to employ many of the strategies learned in Project NExT workshops in my large first-year calculus classes at WSU. The workshops on teaching issues were not the only ones from which I benefited. One of the most valuable sessions I attended was the grant writing workshop at the Atlanta meeting. The detailed information presented about the grant making process at the NSF has helped me considerably in subsequent grant writing. As part of an interdisciplinary team working on grants involving online educational issues, I have had ample opportunity to put to use what I learned as a Project NExT Fellow. These involvements with Project NExT have helped me contribute more effectively to my department.

Project NExT has been of considerable help in my research efforts as well. I have met in connection with Project NExT many people who have mathematical interests similar to mine. Furthermore, Project NExT sponsors sessions for early career mathematicians to present their work. For instance, at the San Diego Joint Meetings, Project NExT and the Young Mathematicians' Network sponsored a poster session in which I participated. There I was able to discuss one of my projects with a variety of people, including an established researcher with similar interests. This led to a mention of my work in a widely read national publication and a front-page human interest story in the local newspaper. This favorable publicity is another example of a benefit my department derived from my involvement in Project NExT.

Project NExT has expanded my network of colleagues in a variety of ways. When I have questions or concerns, it is quite reassuring to know that I can send an e-mail to the NExT list and receive many helpful replies and suggestions. Furthermore, I have greatly expanded my stock of professional and research resources through my involvement in Project NExT. For these reasons I recommend that all new Ph.D.'s in faculty positions consider applying to be Project NExT Fellows. One cannot help but profoundly benefit from such an experience.

Tammy Lefcourt

I first learned of Project NExT when I was a participant in the AWM poster session at the Joint Meetings in Orlando in 1996. It seemed like a fabulous resource for new faculty. In the spring of 1996 I was finishing up my degree and had done the usual huge job search. I was undecided about what sort of balance between research and teaching I was looking for in my professional life. I love both of these aspects of academia. I opted for a postdoc at the University of Texas, where teaching is important but definitely secondary to research.

During my first year at UT I discovered that I enjoyed spending a lot of time on teaching issues. I liked trying new and different things in my classes and working closely with my students. I was looking around for some teaching resources, and a faculty member at UT, Uri Treisman, directed me to Project NExT. I remembered Project NExT from the Joint Meetings and decided to apply.

Being part of the Project NExT network has benefited me tremendously. It has put me into contact with many more new faculty than I would otherwise connect with. It's been great to have the NExT lists to bounce ideas back and forth. In particular, I've had a great experience networking with other NExT Fellows about teaching abstract algebra. Through the NExT e-mail list a subgroup formed. All of us taught or would soon teach an Introduction to Abstract Algebra course. We chatted about the course online and arranged several meetings at our first Project NExT workshop in Atlanta. Our algebra chat room individually and collectively came up with some great ideas for teaching abstract algebra. A presentation at the Joint Meetings in San Antonio has already come out of this collaboration, and a paper is in the works.

Project NExT has also been a great resource for ideas about balancing research, teaching, and family. At the Joint Meetings in Baltimore there was a NExT panel discussion on balancing research and teaching. One suggestion really stood out for me. One of the panelists came into her office one day a week at 3 or 4 a.m. to work on her research. As I do, she had small children, and spending long hours at the office each day was not an alternative. Her solution was to spend *very long* hours once a week. I've incorporated this idea into my work schedule.

I think all institutions can benefit from having their beginning faculty participate in Project NExT. Every department has its own culture; there are specific, sometimes ingrained, ideas about the way mathematics should be taught. Project NExT

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exposes young faculty to different ideas, which we then bring back to our departments. NExT Fellows at research universities particularly benefit from this exposure. Because fellows at research universities are probably in places that are very similar to the institutions from which they received their degrees, they usually have not been exposed to the kinds of teaching strategies that are used at small colleges. I've tried to incorporate ideas from my colleagues at small colleges into some of my classes. I've taught a large Introduction to Mathematics class several times at UT. I've taken some collaborative learning ideas from Project NExT workshops and incorporated them into this class. I don't think trying something like this would have occurred to me if I hadn't heard about people doing such things with their smaller classes at other institutions. An added benefit that my department gets from Project NExT is that I've also been able to share the ideas that I've gotten from other NExT Fellows with other new faculty at UT. One person involved with Project NExT can share information with everyone else. In particular, I've shared my abstract algebra ideas with others in the department.

Through my involvement with Project NExT I've gotten the best of all worlds. I'm in a place with great research resources, and I have access to great teaching resources: the other fellows and the Project NExT consultants. My department also has access to these great teaching resources and ideas. It's a win-win situation for everyone.